Trigger validation for 13.0.30.3

Many thanks to Long Zhao, Chihiro Omachi, Julie Kirk, Giovanni Siragusa, Patricia Conde Muiño, Andreas Reinsch, Olya Igonkina, Andrea Coccaro, Denis Damazio, Valeria Perez Reale for slides, plots and information

Ricardo Gonçalo, RHUL

Physics Validation Meeting – 13 October 2007

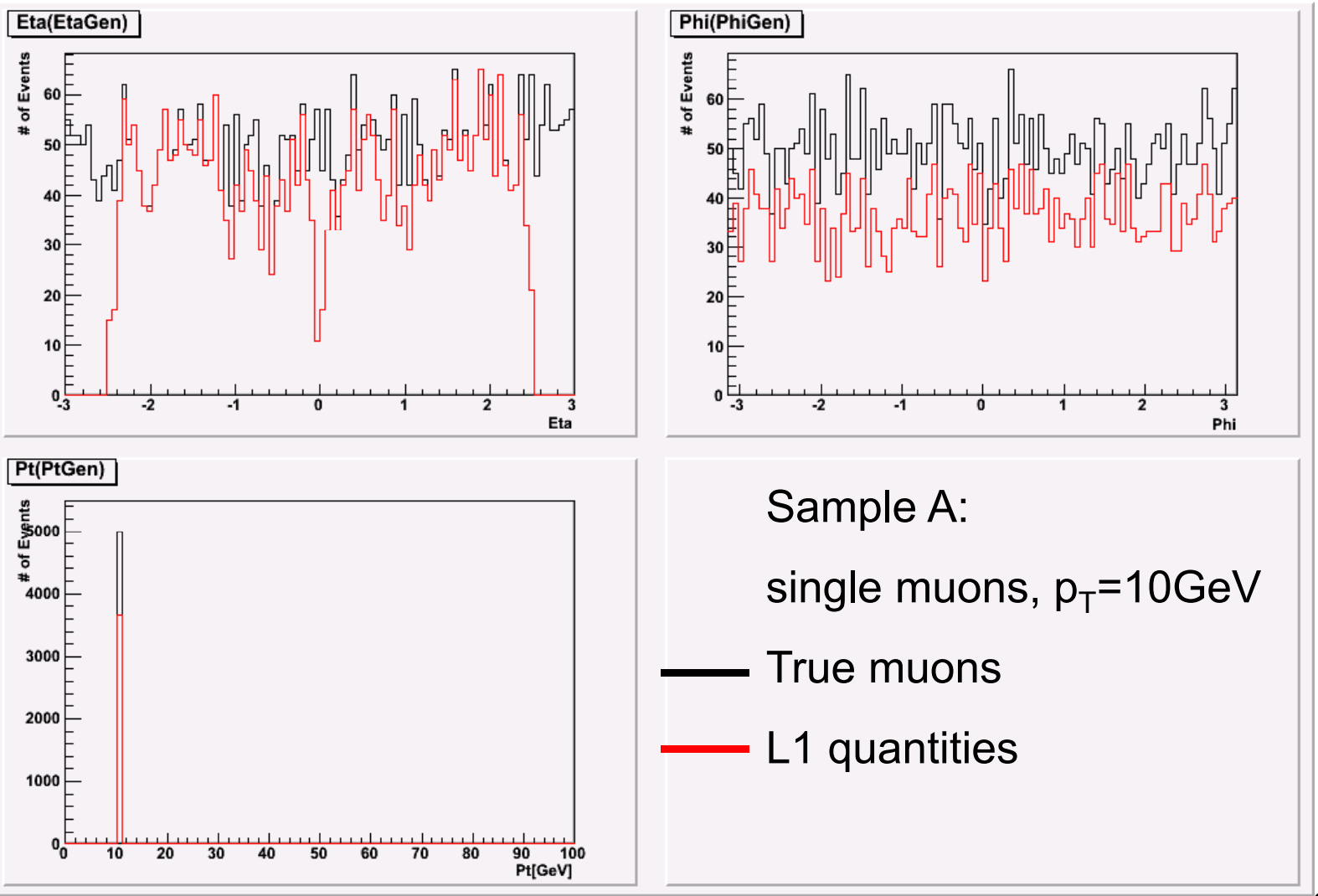
Summary

- Overall looks fine!
- Only worries connected to CBNT:
  - Missing L1 muon CBNT variables: MuROI_N, MUROI_Eta, MuROI_Phi, MuROI_Thr
  - Effect on studies? No one has shouted so far… the variables can bre recovered from AOD
- Feedback from: MET, L1 muons, HLT muons, B physics, Jets, B jets, Taus, Electrons, Photons
- No explicit feedback from L1 calo and L1 CTP (but effect would be noticed in other domains)

OK

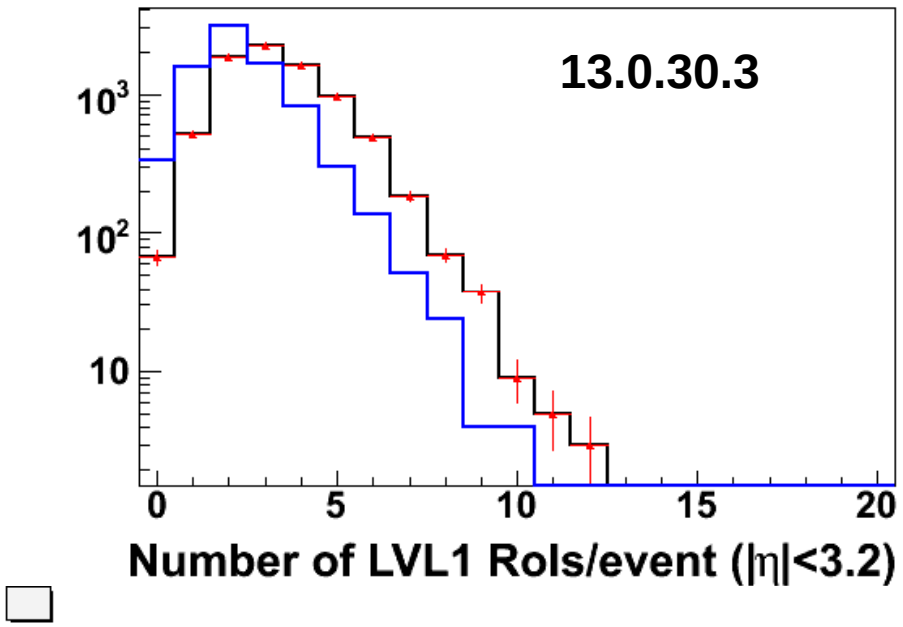
L1 muon trigger simulation

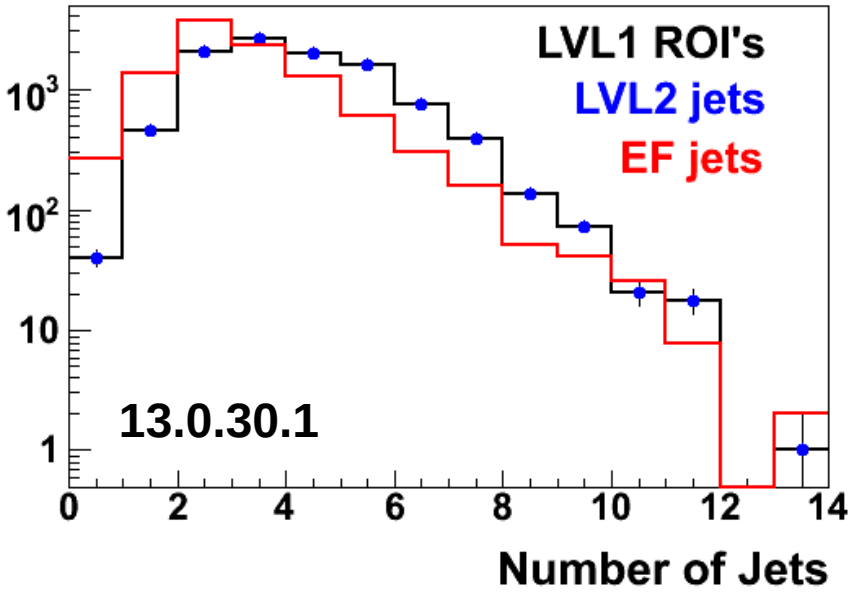
but some variables missing from ntuple

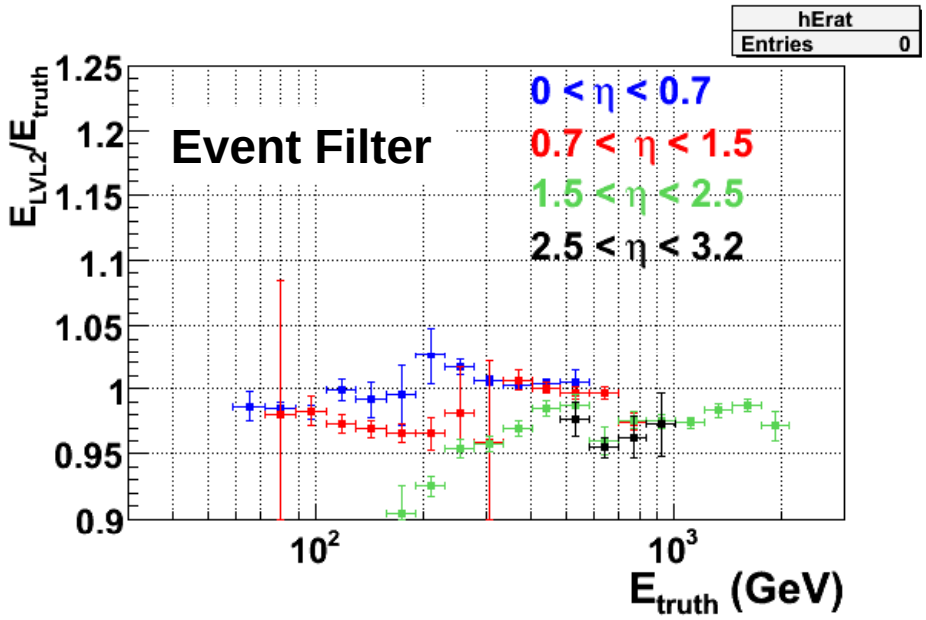


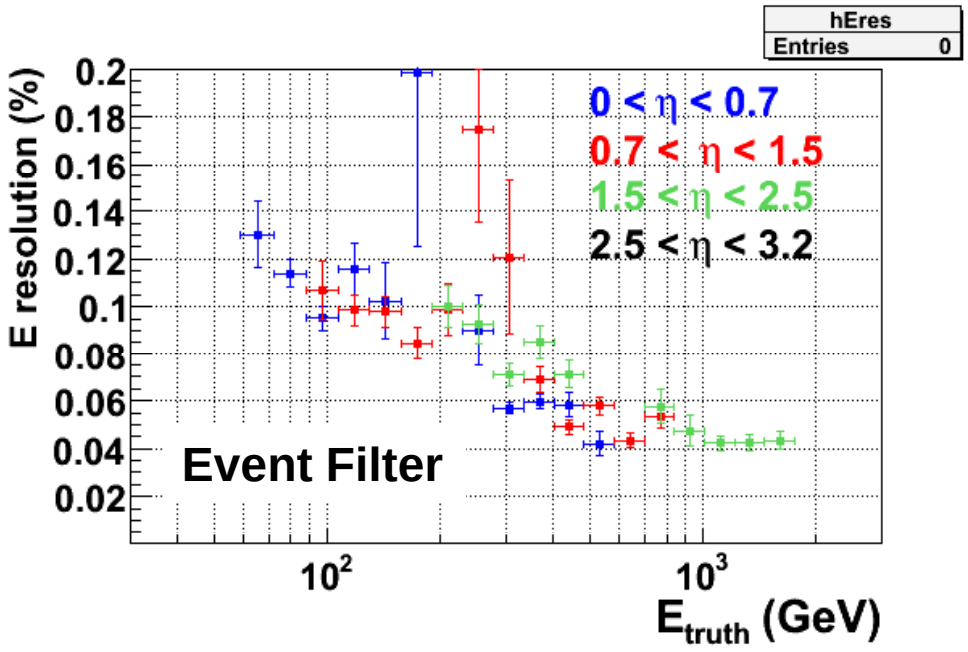
Jets OK

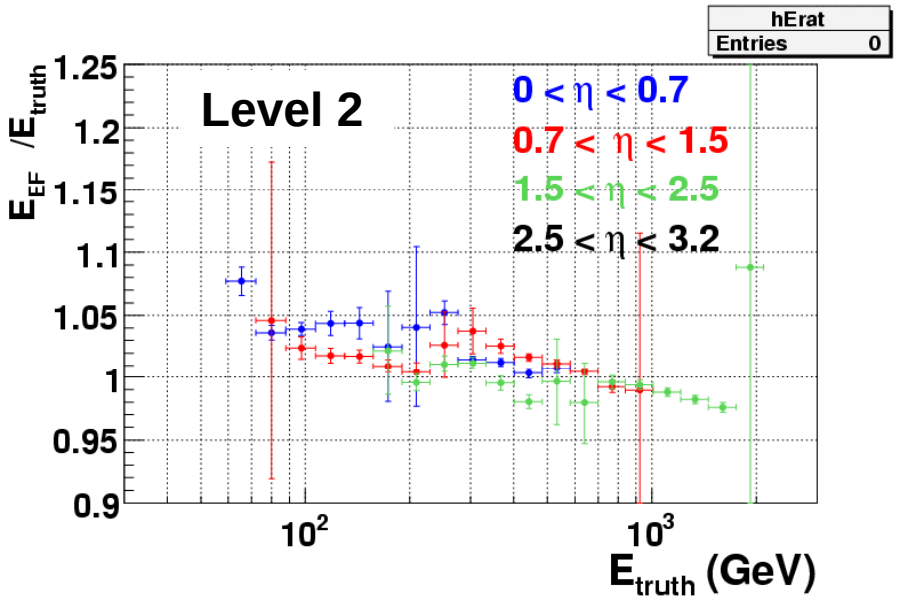
- Sample A plots:
  - Some error messages from ntuples look like (recoverable) file corruption(?)
- 13.X.0 ok … no failing builds

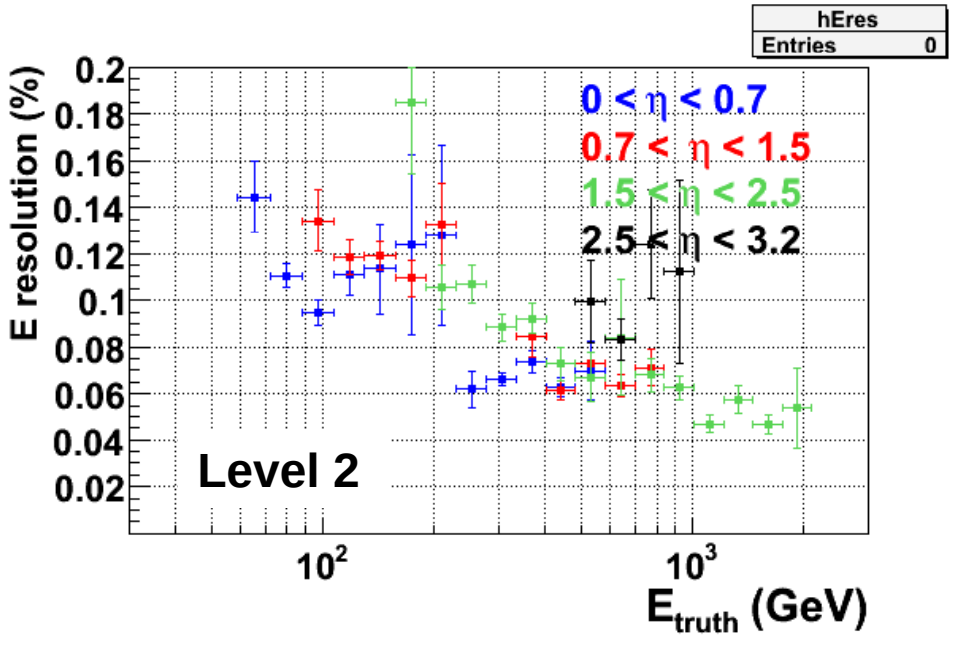





hErat
Entries 0
Event Filter
0 < η < 0.7
0.7 < η < 1.5
1.5 < η < 2.5
2.5 < η < 3.2
E_LVL2/E_truth
E_truth (GeV)


hEres
Entries 0
Event Filter
0 < η < 0.7
0.7 < η < 1.5
1.5 < η < 2.5
2.5 < η < 3.2
E resolution (%)
E_truth (GeV)


hErat
Entries 0
Level 2
0 < η < 0.7
0.7 < η < 1.5
1.5 < η < 2.5
2.5 < η < 3.2
E_EF /E_truth
E_truth (GeV)


hEres
Entries 0
Level 2
0 < η < 0.7
0.7 < η < 1.5
1.5 < η < 2.5
2.5 < η < 3.2
E resolution (%)
E_truth (GeV)

$B_s \rightarrow D_s(\Phi(KK)\pi)\pi$

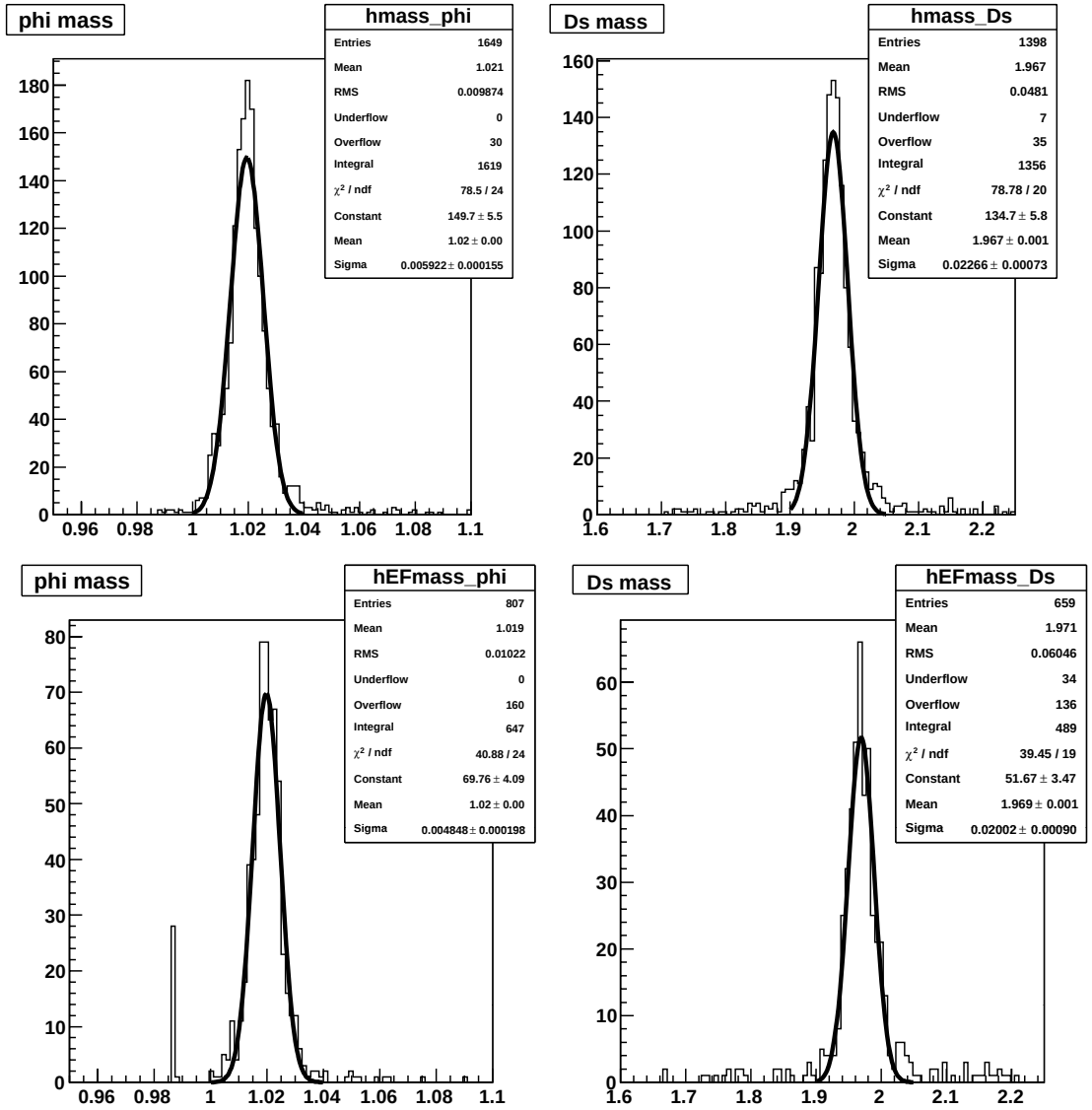
OK

L2
Φ mass 1020 +/- 6 MeV
Ds mass 1967 +/- 23 MeV

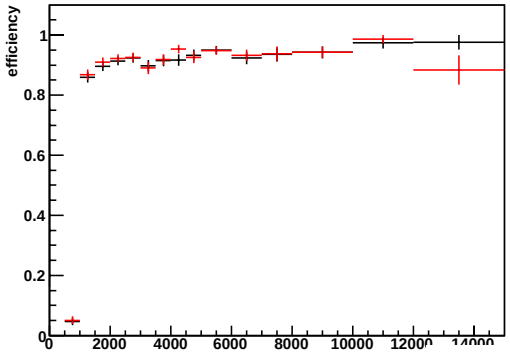
In 13.0.30.1:
1019 +/- 6 MeV and
1966 +/- 22 MeV

EF
Φ mass 1020 +/- 5 MeV
Ds mass 1969 +/- 20 MeV

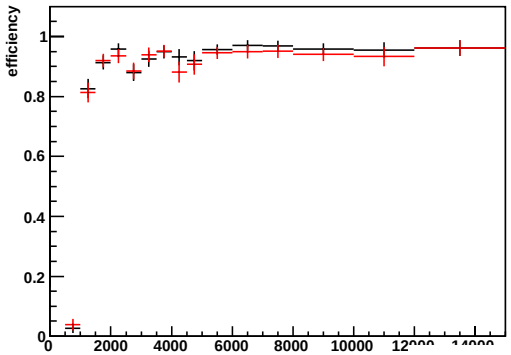
In 13.0.30.1:
1020 +/- 5 MeV and
1970 +/- 20 MeV



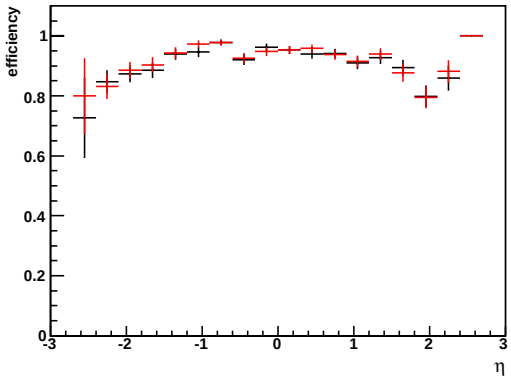
kaons



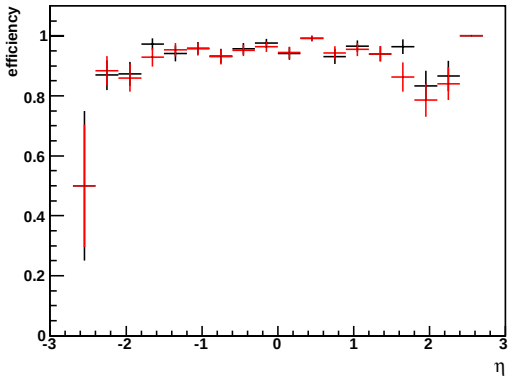
pions



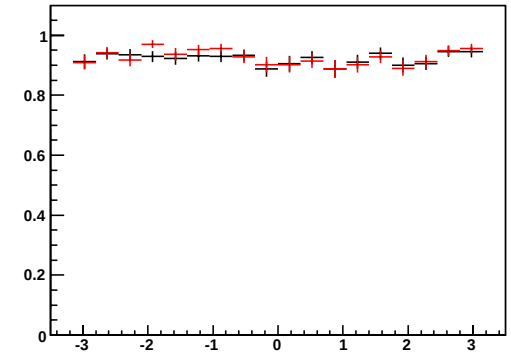
pT 15 GeV



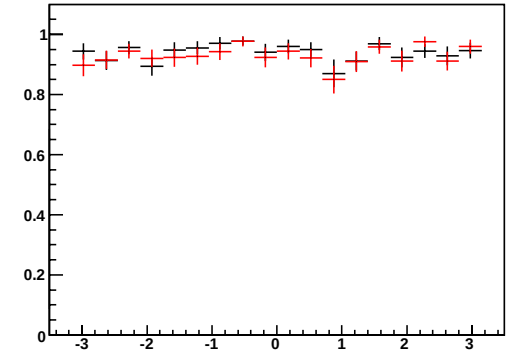
pT 15 GeV



eta



eta



phi

phi

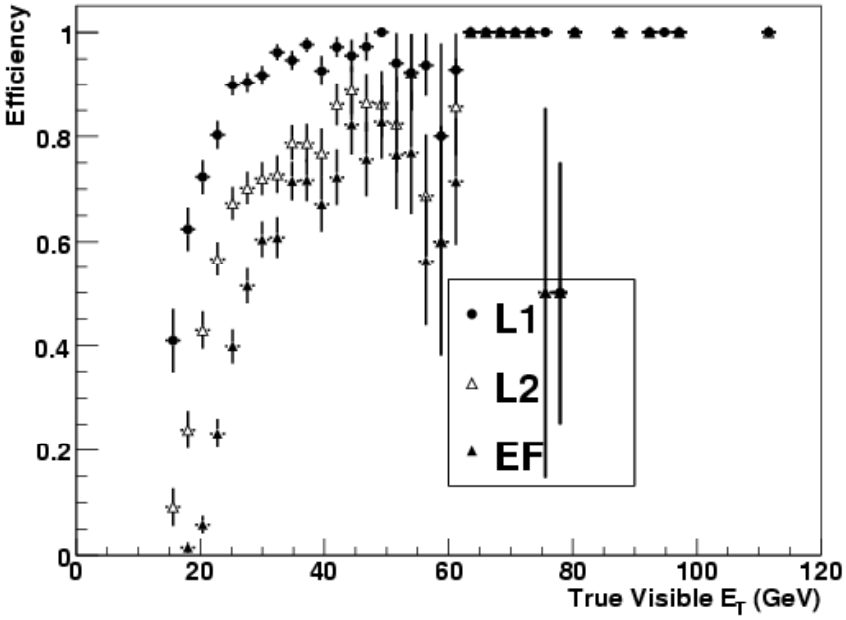
Tracking efficiencies
For kaons and pions

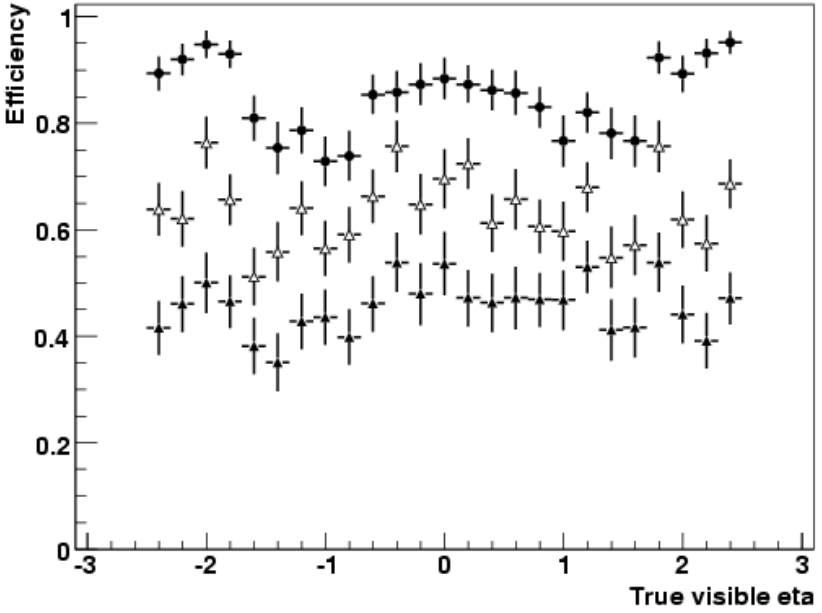
13.0.30.1 V 13.0.30.3

ALL LOOKS OK

OK Tau

- 5k events - $W \rightarrow \tau\nu$ (hadronic decay)
- No problems seen
- TrigDecision agrees with cuts on ntuple variables down to 1 event





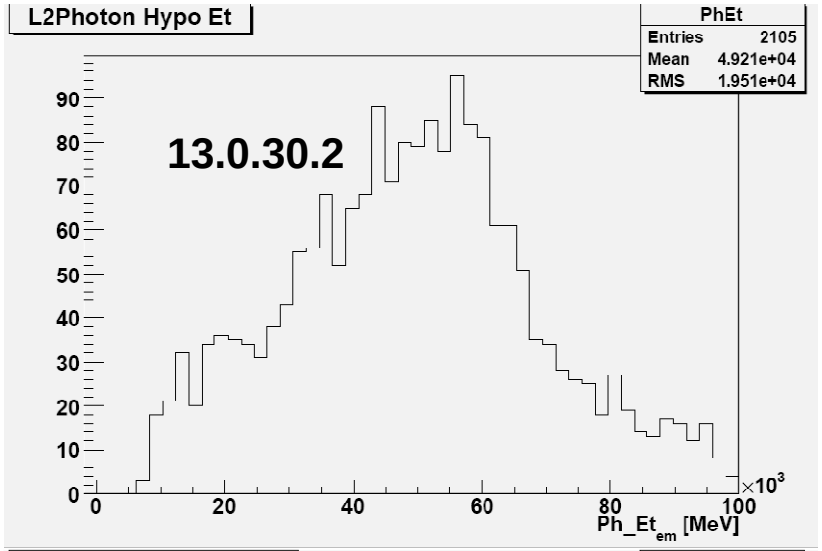
OK Release 13.0.30.3 Photon Slice Validation

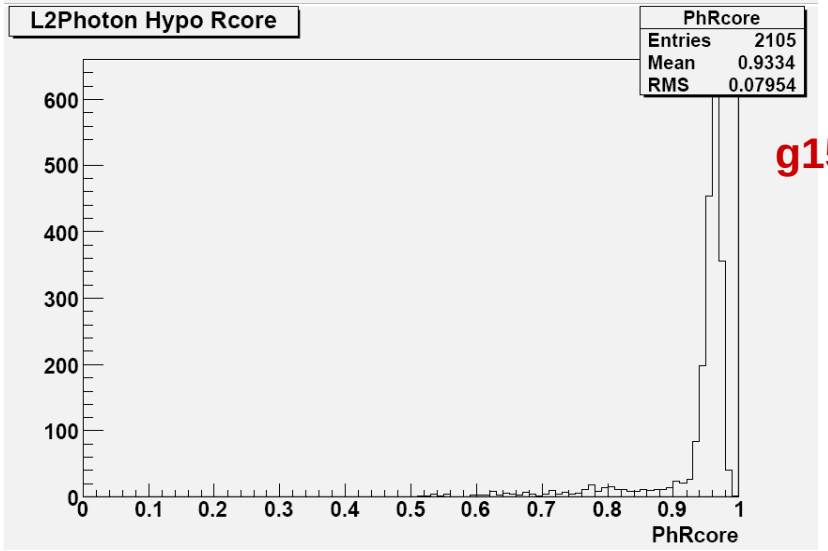
- *Release 13.0.30.2:*
  - Includes 10^31 photon menus (fixes for g25 & g25i photon triggers)
  - Includes 10^32 photon menus
- *Release 13.0.30.3:*
  - Includes 3 new 10^32 photon menus (g25_tight & g25i_tight and g150)
- *No change in photon trigger performance expected between 13.0.30.2 and 13.0.30.3*

Validation sample: 1k events

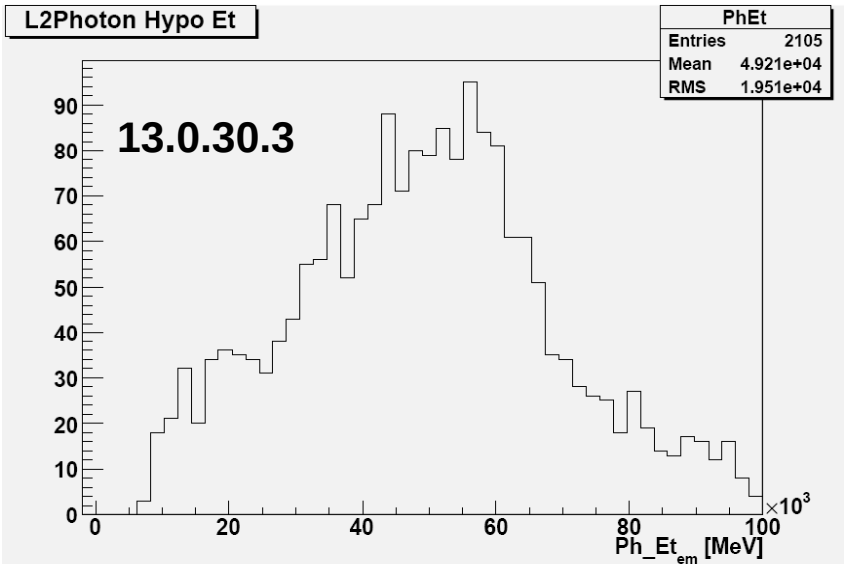
- *trig1_misal1_valid1.006384.PythiaH120gamgam.recon.v13003003 (0015353)*
- *trig1_misal1_valid1.006384.PythiaH120gamgam.recon.v13003003*

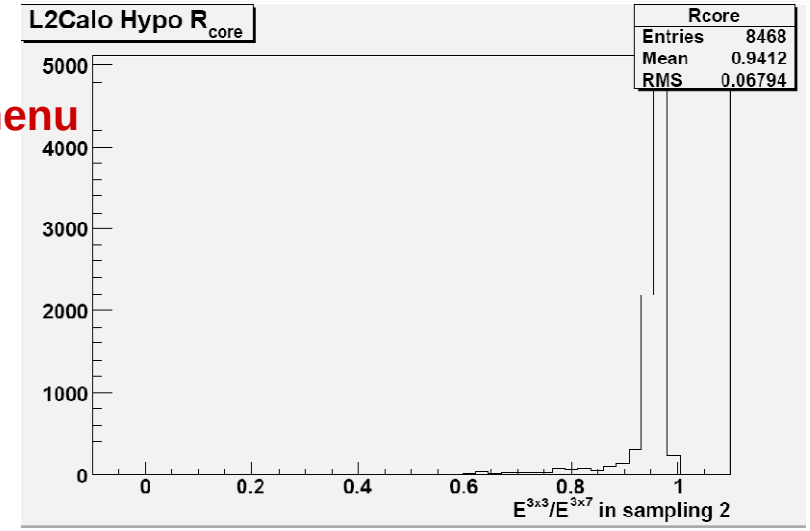
L2 Photon Selection Variables



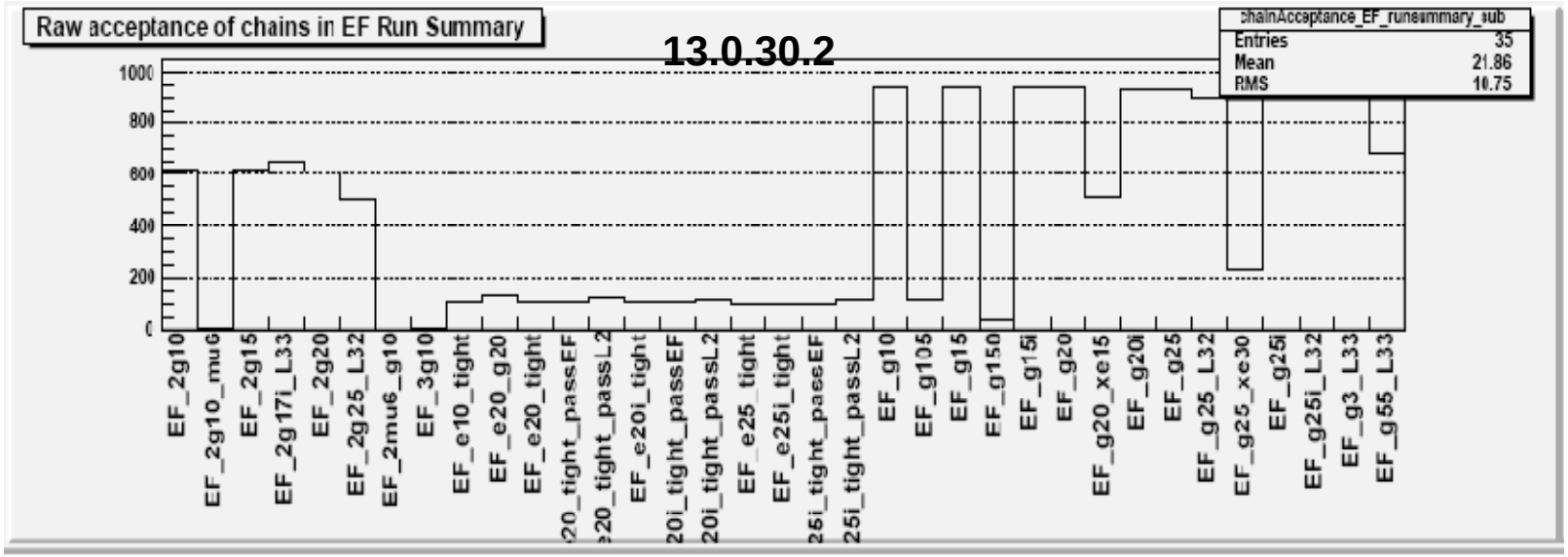


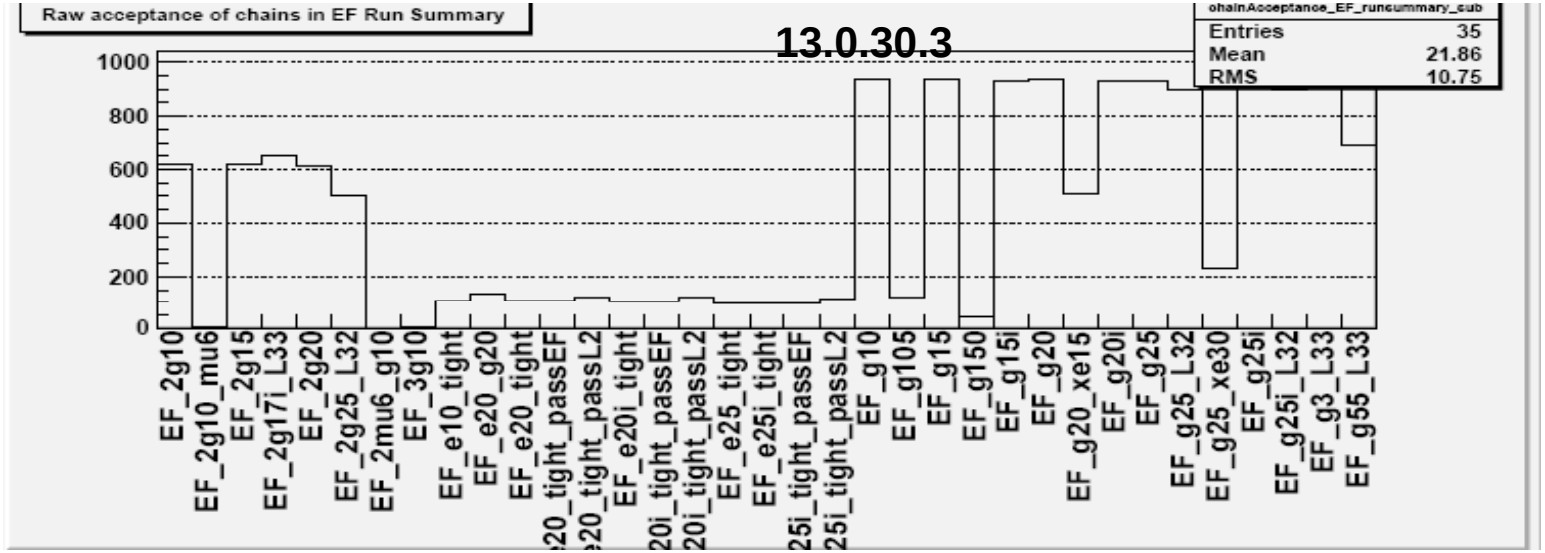
g15 menu





Photon Trigger Menus





Other slices

- Bjets: all ok
- Inner Detector: all ok
- Muons: all ok but no L1 muon variables in CBNT
  - This is strange since the variables were there last week (from transformations tests)
  - The variables can be recovered from AOD

OK

Electrons

Results w.r.t. Truth (Et > 18 GeV and Eta < 2.5)

	Zee Electrons (2862 events)		**Single Electrons (2000 events)**		**Hgg Gamma (9635 events)**	
Level 1 E25i	91.6 +- 2.5 %		92.2 +- 3.0 %		95.2 +- 1.4 %	
Level 2 Calo e25i	83.2 +- 2.3 %		84.4 +- 2.8 %		89.8 +- 1.3 %	
	ID Scan	SiTrack	ID Scan	SiTrack	ID Scan	SiTrack
Level 2 ID e25i	77.0 +- 2.2 %	77.0 +- 2.2 %	78.2 +- 2.6 %	78.5 +- 2.6 %	10.1 +- 0.3 %	5.2 +- 0.2 %
Event Filter Calo e25i	74.8 +- 2.1 %	74.9 +- 2.1 %	66.7 +- 2.4 %	67.3 +- 2.4 %	9.8 +- 0.3 %	5.1 +- 0.2 %

	Zee Electrons (36 events)		**Single Electrons (0 events)**		**Hgg Gamma (96 events)**	
Level 1 E25i	86.1 +- 21.1 %		0.0 +- 0.0 %		92.7 +- 13.6 %	
Level 2 Calo e25i	75.0 +- 19.1 %		0.0 +- 0.0 %		85.4 +- 12.8 %	
	ID Scan	SiTrack	ID Scan	SiTrack	ID Scan	SiTrack
Level 2 ID e25i	69.4 +- 18.1 %	66.7 +- 17.6 %	0.0 +- 0.0 %	0.0 +- 0.0 %	12.5 +- 3.8 %	8.3 +- 3.1 %
Event Filter Calo e25i	63.9 +- 17.1 %	61.1 +- 16.5 %	0.0 +- 0.0 %	0.0 +- 0.0 %	12.5 +- 3.8 %	8.3 +- 3.1 %

Results w.r.t. Truth (Et > 18 GeV and Eta < 2.5)

	Zee Electrons (36 events)		Single Electrons (0 events)		Hgg Gamma (96 events)	
Level 1 E25i	86.1 +- 21.1 %		0.0 +- 0.0 %		92.7 +- 13.6 %	
Level 2 Calo e25i	75.0 +- 19.1 %		0.0 +- 0.0 %		85.4 +- 12.8 %	
	ID Scan	SiTrack	ID Scan	SiTrack	ID Scan	SiTrack
Level 2 ID e25i	69.4 +- 18.1 %	66.7 +- 17.6 %	0.0 +- 0.0 %	0.0 +- 0.0 %	12.5 +- 3.8 %	8.3 +- 3.1 %
Event Filter Calo e25i	63.9 +- 17.1 %	61.1 +- 16.5 %	0.0 +- 0.0 %	0.0 +- 0.0 %	12.5 +- 3.8 %	8.3 +- 3.1 %

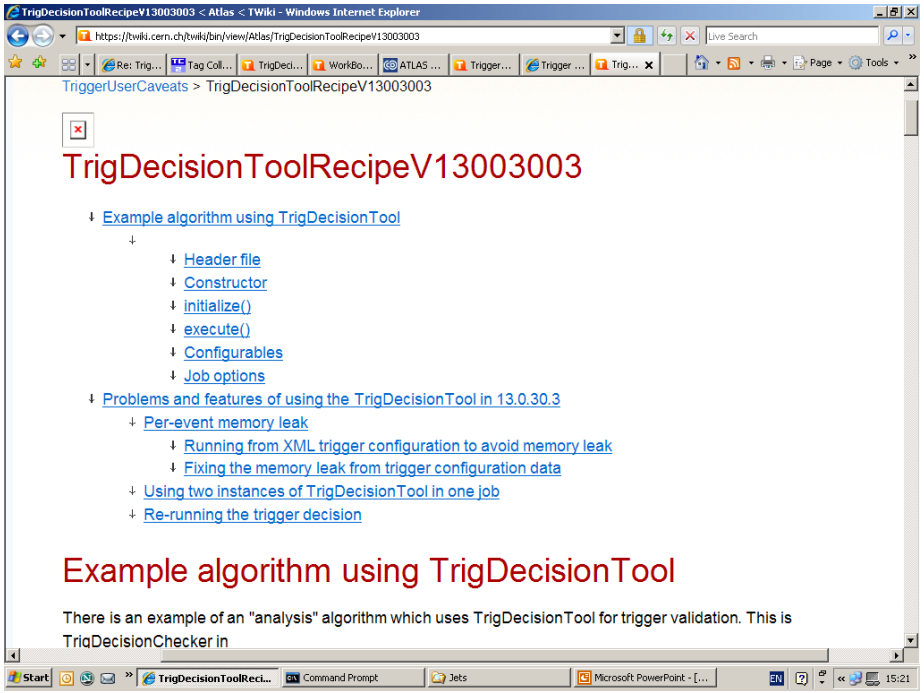
Results w.r.t. Offline Reconstruction (Egamma - Et > 18 GeV, Eta < 2.5 and isEM() == 0)

	Zee Electrons (153 events)		Single Electrons (0 events)		Hgg Gamma (210 events)	
Level 1 E25i	94.1 +- 10.9 %		0.0 +- 0.0 %		89.5 +- 9.0 %	
Level 2 Calo e25i	87.6 +- 10.4 %		0.0 +- 0.0 %		76.2 +- 8.0 %	
	ID Scan	SiTrack	ID Scan	SiTrack	ID Scan	SiTrack
Level 2 ID e25i	42.5 +- 6.3 %	39.9 +- 6.0 %	0.0 +- 0.0 %	0.0 +- 0.0 %	38.6 +- 5.0 %	35.7 +- 4.8 %
Event Filter Calo e25i	39.9 +- 6.0 %	37.3 +- 5.8 %	0.0 +- 0.0 %	0.0 +- 0.0 %	36.2 +- 4.8 %	33.3 +- 4.6 %

Results for jets

TrigDecisionTool Troubles

- https://twiki.cern.ch/twiki/bin/view/Atlas/TrigDecisionToolRecipeV13003003
- A recipe is in place, but the issue is far from over
  - But AODs produced are ok
- Memory leak in AODHLTConfigSvc fixed post 13.0.30.3
- A re-design of the configuration is being considered (current scheme is fragile)
- Will keep updating the recipe
- Many thanks for the feedback! It's the main reason why this is improving!



Summary

No showstoppers so far